CLAIMS

1. A processor-readable medium comprising processor-executable instructions for focusing optics, the processor-executable instructions comprising instructions for:

generating a data profile, wherein the data profile is configured to provide signals for operation of an actuator, wherein the signals result in focus of the optics on a label region of an optical disc; and

printing an image on the label region of the optical disc while focusing the optics by applying signals to the actuator according to the data profile.

2. A processor-readable medium as recited in claim 1, wherein generating the data profile comprises further instructions for:

configuring a look-up table with signal data, wherein the signal data are associated with focusing on locations within the label region.

3. A processor-readable medium as recited in claim 1, wherein generating the data profile comprises further instructions for:

configuring a function to generate signal data, wherein the function associates locations within the label region with appropriate signals.

4. A processor-readable medium as recited in claim 3, wherein configuring a function comprises further instructions for:

generating coefficient data for a Fourier series.

5. A processor-readable medium as recited in claim 3, wherein configuring a function comprises further instructions for:

generating coefficient data for a polynomial series.

6. A processor-readable medium as recited in claim 1, wherein the generating comprises further instructions for:

applying an AC component of a signal to the actuator as the optical disc turns, wherein the AC component causes the optics to pass through a focal point in both directions on each cycle of the AC component; and

recording a voltage into a voltage data look-up table which was applied to the actuator and which was associated with a SUM signal peak which resulted from the passage of the optics through the focal point.

7. A processor-readable medium as recited in claim 6 wherein the sum signal peak is determined by measuring sides of the sum signal peak and averaged.

8. A processor-readable medium as recited in claim 6, comprising additional instructions for adjusting the recorded voltage by a phase shift corresponding to a lag time associated with the operation of the actuator.

9. A processor-readable medium as recited in claim 6, comprising further instructions for:

calibrating the actuator to determine an angle by which the actuator lags an input signal for at least one frequency; and

adjusting the recorded voltage by the angle.

10. A processor-readable medium as recited in claim 6, wherein applying the AC component of the signal comprises instructions to repeat the AC signal at a frequency which results in at least eight SUM signal peaks per revolution of the optical disc.

11. A processor-readable medium as recited in claim 1, comprising further instructions for:

calibrating the actuator to determine an angle by which the actuator lags an input signal for frequencies associated with printing the image at least two radial distances from a hub of the optical disc; and

organizing the data profile according to the at least two radial distances and according to signals resulting in focus in a plurality of sectors of the optical disc.

12. A processor-readable medium as recited in claim 11, wherein calibrating the actuator comprises further instructions for:

applying an AC signal to the actuator, wherein the AC signal results in the actuator moving the optics back and forth through a focal point causing a plurality of SUM signal peaks;

adjusting a DC offset to the signal until the plurality of SUM signal peaks are evenly space; and

measuring an angle between a SUM signal peak and an associated mid-point of the AC signal.

13. A processor-readable medium as recited in claim 12, wherein applying the AC component of the signal comprises instructions for applying a triangle wave to the actuator.

14. A processor-readable medium as recited in claim 11, comprising further instructions for:

moving the optics toward a hub location of the optical disc; and

maintaining the optical disc in a stationary condition during the calibrating.

15. A processor-readable medium as recited in claim 1, wherein generating the data profile comprises instructions for including data within the data profile associated with at least two radial distances from a center of the optical disc, wherein the data associated with each radial distance is phase-shifted according to a lag-time of the actuator at a frequency associated with printing a portion of the image on the label region of the optical disc located approximately at the radial distance.

16. A processor-readable medium as recited in claim 1, comprising further instructions for:

indexing the data profile according to an angular orientation of the optical disc; and

fetching data from the data profile according to the angular orientation of the optical disc during the printing of the image on the label region.

17. A processor-readable medium as recited in claim 1, wherein printing the image comprises further instructions for:

interpolating between data in the data profile; and

applying the interpolated values to the actuator wherein a specific data for the actuator is not prescribed by the data profile.

18. A processor-readable medium as recited in claim 1, wherein printing the image comprises further instructions for:

interpolating between measured signals within the data profile using an at least first-order equation; and

wherein the interpolating is a function of an angular orientation of the optical disc.

19. A processor-readable medium as recited in claim 1, wherein printing the image comprises further instructions for:

interpolating between measured signals within the data profile using an at least first-order equation; and

wherein the interpolating is a function of a radial distance by which a focal point is from a center of the optical disc.

20. A processor-readable medium as recited in claim 1, wherein printing the image comprises further instructions for:

interpolating voltage data between known levels within a voltage data look-up table using a second-order equation; and

using the interpolated voltage data to control operation of the actuator wherein a specific voltage level for the actuator is not prescribed by the voltage look-up table.

21. A processor-readable medium as recited in claim 1, comprising instructions which configure the data profile as a piece-wise continuous function.

22. A processor-readable medium as recited in claim 21, wherein the instructions which configure the piece-wise continuous function phase-shift the piece-wise continuous function by an angle associated with a lag time associated with the operation of the actuator.

23. A method for focusing optics, comprising:

generating a data look-up table, wherein the data look-up table provides signal levels for operation of an actuator which result in focus of the optics on a plurality of locations within a label region of an optical disc; and

printing an image on the label region of the optical disc while focusing the optics by applying signals to the actuator according to the data look-up table.

24. A method as recited in claim 23, wherein the generating comprises:

applying an AC component of a signal to the actuator as the optical disc turns, wherein the AC component causes the optics to pass through a focal point in both directions on each cycle of the AC component; and

recording a signal into the data look-up table which was applied to the actuator and which was associated with a SUM signal peak which resulted from the passage of the optics through the focal point.

25. A method as recited in claim 24, wherein the sum signal peak is determined by measuring sides of the sum signal peak and averaged.

26. A method as recited in claim 23, additionally comprising adjusting the recorded signal by a phase shift corresponding to a lag time associated with the operation of the actuator.

27. A method as recited in claim 23, additionally comprising for:

calibrating the actuator to determine an angle by which the actuator lags an input signal for at least one frequency; and

adjusting the recorded signal by the angle.

28. A method as recited in claim 23, wherein the generating a data look up table comprises:

applying an AC component of a signal to the actuator as the optical disc turns, wherein the AC component causes the optics to pass through a focal point in both directions on each cycle of the AC component; and

recording a signal into the data look-up table which was applied to the actuator and which was associated with recognizing a pattern on the optical disc which resulted from the passage of the optics through the focal point.

29. A method as recited in claim 23, additionally comprising:

calibrating the actuator to determine an angle by which the actuator lags an input signal for frequencies associated with printing the image at least two radial distances from a hub of the optical disc; and

organizing the look-up table according to the at least two radial distances and according to signals resulting in focus in a plurality of sectors of the optical disc.

30. A method as recited in claim 29, wherein calibrating the actuator comprises:

applying an AC signal to the actuator, wherein the AC signal results in the actuator moving the optics back and forth through a focal point causing a plurality of SUM signal peaks;

adjusting a DC offset to the signal until the plurality of SUM signal peaks are evenly space; and

measuring an angle between a SUM signal peak and an associated mid-point of the AC signal.

31. A method as recited in claim 29, wherein calibrating the actuator comprises:

applying an AC signal to the actuator, wherein the AC signal results in the actuator moving the optics back and forth through a focal point causing a multiple recognitions of a pattern marked on the optical disc;

adjusting a DC offset to the signal until the multiple recognitions are evenly space; and

measuring an angle between a time of a recognition and an associated mid-point of the AC signal.

32. A method as recited in claim 23, wherein generating the data look-up table comprises including data within the look-up table associated with at least two radial distances from a center of the optical disc, wherein the data associated with each radial distance is phase-shifted according to a lag-time of the actuator at a frequency associated with printing a portion of the image on the label region of the optical disc located approximately at the radial distance.

33. A method as recited in claim 23, further comprising:

indexing the data look-up table according to angular orientation of the optical disc; and

fetching data from the look-up table according to the angular orientation of the optical disc during the printing of the image on the label region.

34. A method as recited in claim 23, wherein the data look-up table is configured as a piece-wise continuous function.

35. A system for focusing optics, comprising:

logic configured for generating a data profile, wherein the profile is configured to provide signals for operation of an actuator, wherein the signals result in focus of the optics on a label region of an optical disc; and

logic configured for printing an image on the label region of the optical disc while focusing the optics by applying signals to the actuator according to the data profile.

36. A system as recited in claim 35, wherein generating the data profile comprises:

logic configured for forming a look-up table with signal data, wherein the signal data are associated with focusing on a plurality of locations within the label region.

37. A system as recited in claim 35, wherein generating the data profile comprises:

logic for configuring generation of a function to produce signals, wherein the function associates locations within the label region with appropriate signals to result in focus on the locations.

38. A system as recited in claim 37, wherein the logic for configuring generation of the function comprises:

logic configured for generating coefficients for a Fourier series.

39. A system as recited in claim 37, wherein the logic for configuring generation of the function comprises:

logic configured for generating coefficients for a polynomial series.

40. A system as recited in claim 35, wherein the logic configured for generating a data profile comprises:

logic configured for applying an AC component of a signal to the actuator as the optical disc turns, wherein the AC component causes the optics to pass through a focal point in both directions on each cycle of the AC component; and

logic configured for recording a voltage into a voltage data look-up table which was applied to the actuator and which was associated with a SUM signal peak which resulted from the passage of the optics through the focal point.

41. A system as recited in claim 40, additionally comprising logic configured for adjusting the recorded voltage by a phase shift corresponding to a lag time associated with the operation of the actuator.

42. A system as recited in claim 40, wherein the logic configured for applying the AC component of the signal comprises logic configured for repeating the AC signal at a frequency which results in at least eight SUM signal peaks per revolution of the optical disc.

43. A system as recited in claim 35, wherein the logic configured for generating comprises:

logic configured for applying an AC component of a signal to the actuator as the optical disc turns, wherein the AC component causes the optics to pass through a focal point in both directions on each cycle of the AC component; and

logic configured for recording a voltage into a voltage data look-up table within the data profile, wherein the voltage was applied to the actuator and was associated with a recognition of a pattern on the optical disc which resulted from the passage of the optics through the focal point.

44. A system as recited in claim 35, further comprising:

logic configured for calibrating the actuator to determine an angle by which the actuator lags an input signal for frequencies associated with printing the image at least two radial distances from a hub of the optical disc; and

logic configured for organizing a look-up table within the data profile according to the at least two radial distances and according to voltages resulting in focus in a plurality of sectors of the optical disc.

45. A system as recited in claim 44, wherein logic configured for calibrating the actuator comprises:

logic configured for applying an AC signal to the actuator, wherein the AC signal results in the actuator moving the optics back and forth through a focal point causing a plurality of SUM signal peaks;

logic configured for adjusting a DC offset to the signal until the plurality of SUM signal peaks are evenly space; and

logic configured for measuring an angle between a SUM signal peak and an associated mid-point of the AC signal.

46. A system as recited in claim 44, wherein logic configured for calibrating the actuator comprises:

logic configured for applying an AC signal to the actuator, wherein the AC signal results in the actuator moving the optics back and forth through a focal point causing multiple recognitions of a pattern on the optical disc;

logic configured for adjusting a DC offset to the signal until the recognitions are evenly space; and

logic configured for measuring an angle between a recognition and an associated mid-point of the AC signal.

47. A system as recited in claim 44, further comprising:

logic configured for moving the optics toward a hub location of the optical disc; and

logic configured for maintaining the optical disc in a stationary condition during the calibrating.

48. A system as recited in claim 35, wherein the logic configured for generating the data profile comprises logic configured for including data within a look-up table within the data profile, wherein the data is associated with at least two radial distances from a center of the optical disc, and wherein the data associated with each radial distance is phase-shifted according to a lag-time of the actuator at a frequency associated with printing a portion of the image on the label region of the optical disc located approximately at one of the at least two radial distances.

49. A system as recited in claim 35, further comprising:

logic configured for indexing a voltage data look-up table within the data profile according to angular orientation of the optical disc; and

logic configured for fetching voltage data from the look-up table according to the angular orientation of the optical disc during the printing of the image on the label region.

50. A system as recited in claim 35, wherein the logic configured for printing the image comprises:

logic configured for interpolating between voltage levels obtained from a voltage look-up table within the data profile; and

logic configured for applying the interpolated values to the actuator wherein a specific voltage level for the actuator is not prescribed by the voltage look-up table.

51. A system as recited in claim 35, wherein the logic configured for printing the image further comprises:

logic configured for interpolating between voltage levels in a voltage look-up table within the data profile using a first-order equation; and

wherein the logic configured for the interpolating is a function of an angular orientation of the optical disc.

52. A system as recited in claim 35, wherein the logic configured for printing the image comprises:

logic configured for interpolating signal data between known signals obtained from the data profile; and

logic configured for using the interpolated signals to control operation of the actuator.

53. A system as recited in claim 35, additionally comprising logic configured for configuring the data profile as a piece-wise continuous function.

54. A system as recited in claim 53, wherein the logic configured for configuring the piece-wise continuous function phase-shifts the piece-wise continuous function by an angle associated with a lag time associated with the operation of the actuator.

55. An optical disc drive comprising:

means for generating a data profile, wherein the data profile is configured to provide signals for operation of an actuator, wherein the signals result in focus of the optics on a label region of an optical disc; and

means for printing an image on the label region of the optical disc while focusing the optics by applying signals to the actuator according to the data profile.

55. An optical disc drive as recited in claim 55, wherein the means for generating the data profile further comprises:

means for configuring a look-up table with signal data, wherein the signal data are associated with focusing on locations within the label region.

56. An optical disc drive as recited in claim 55 wherein the means for generating the data profile further comprises:

means for configuring a function to generate signal data, wherein the function associates locations within the label region with appropriate signals.

57. An optical disc drive as recited in claim 55 wherein the means for generating the data profile further comprises:

means for applying an AC component of a signal to the actuator as the optical disc turns, wherein the AC component causes the optics to pass through a focal point in both directions on each cycle of the AC component; and

means for recording a voltage into a voltage data look-up table which was applied to the actuator and which was associated with a SUM signal peak which resulted from the passage of the optics through the focal point.

58. An optical disc drive as recited in claim 55 further comprising:

means for calibrating the actuator to determine an angle by which the actuator lags an input signal for frequencies associated with printing the image at least two radial distances from a hub of the optical disc; and

means for organizing the data profile according to the at least two radial distances and according to signals resulting in focus in a plurality of sectors of the optical disc.

59. An optical disc drive as recited in claim 55 wherein the means for generating the data profile further comprises:

means for including data within the data profile associated with at least two radial distances from a center of the optical disc, wherein the data associated with each radial distance is phase-shifted according to a lag-time of the actuator at a frequency associated with printing a portion of the image on the label region of the optical disc located approximately at the radial distance.

60. An optical disc drive as recited in claim 55 further comprising:

means for indexing the data profile according to an angular orientation of the optical disc; and

means for fetching data from the data profile according to the angular orientation of the optical disc during the printing of the image on the label region.

61. An optical disc drive as recited in claim 55 wherein the means for printing further comprises:

means for interpolating between data in the data profile; and

means for applying the interpolated values to the actuator wherein a specific data for the actuator is not prescribed by the data profile.

62. An optical disc drive as recited in claim 55 wherein the means for printing further comprises:

means for interpolating between measured signals within the data profile using an at least first-order equation; and wherein the means for interpolating is a function of an angular orientation of the optical disc.